

***Abstract of the Disclosure***

**[0055]** A fiber characterization arrangement utilizes Fourier domain optical coherence tomography (FDOCT) to measure the cross-section of optical fibers, thus providing information sub-surface features, coating thickness/concentricity and stress-induced birefringence under tension. The FDOCT technique can also be used to study microstructured fibers. By making FDOCT measurements on a fiber placed in a cavity, the geometric and optical thickness of the fiber can be simultaneously measured, allowing for the determination of the refractive index of the fiber.